

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Previously Presented) A process for the production of synthesis gas ("syngas") comprising carbon monoxide and molecular hydrogen, said process comprising;
exothermically reacting hydrocarbon-containing fuel with an oxidant gas comprising molecular oxygen in a first reactor to produce an exothermically-generated syngas product;
combining a stream of reactive diluent fluid with a stream of said exothermically-generated syngas product to produce a reactive mixture;
reacting said reactive mixture in a catalytic second reactor to produce a reacted syngas product; and
endothermically reforming hydrocarbon-containing fuel gas with steam over a catalyst in a heat exchange reformer to produce a heat exchange-reformed syngas product,
wherein at least a portion of the heat required in the generation of said heat exchange-reformed syngas product is obtained by recovering heat from said reacted syngas product thereby cooling said reacted syngas.
2. (Original) The process as claimed in Claim 1 wherein said heat exchange-reformed syngas product is combined with said reacted syngas product prior to heat recovery.
3. (Previously Presented) The process as claimed in Claim 1 wherein the reactive diluent fluid controls the temperature of the exothermically-generated syngas product.
4. (Previously Presented) The process as claimed in Claim 1, wherein the oxidant gas consists of molecular oxygen.

5. (Previously Presented) The process as claimed in Claim 1, wherein the hydrocarbon fuel is reacted with the oxidant gas in the presence of water.
6. (Previously Presented) The process as claimed in Claim 1, wherein the reactive mixture comprises carbon dioxide, at least a portion of which is reacted together with at least a portion of the molecular hydrogen in said reactive mixture over a catalyst in a reverse water gas shift reaction zone in the second reactor to produce a carbon monoxide-enriched syngas product.
7. (Previously Presented) The process as claimed in Claim 1, wherein the reactive mixture comprises solid carbon particles, at least a portion of which is gasified by reaction with at least one other component of the reactive mixture in a gasification zone in the second reactor to produce a solid carbon-depleted syngas product.
8. (Previously Presented) The process as claimed in Claim 1, wherein the reactive diluent fluid is a gas thereby cooling the exothermically-generated syngas product via sensible heat exchange.
9. (Previously Presented) The process as claimed in Claim 1, wherein the reactive diluent fluid is a liquid thereby cooling the exothermically-generated syngas product *via* vaporisation and sensible heat exchange.
10. (Previously Presented) The process as claimed in any of Claim 1, wherein the reactive diluent fluid is recovered and recycled from downstream processing of syngas.
11. (Previously Presented) The process as claimed in any of Claim 1, wherein the reactive diluent fluid comprises carbon dioxide.

12. (Original) The process as claimed in Claim 11 wherein the reactive diluent fluid comprises carbon dioxide separated and recycled from downstream syngas.

13. (Original) The process as claimed in Claim 11 wherein the reactive diluent fluid comprises the products of a combustion process.

14. (Original) The process as claimed in Claim 13 wherein the combustion products are selected from the group consisting of combustion furnace flue gases and gas turbine exhaust gas.

15. (Original) The process as claimed in Claim 11 wherein the reactive diluent fluid comprises carbon dioxide imported from an external source.

16. (Previously Presented) The process as claimed in Claim 1, wherein the reactive diluent fluid further comprises a component selected from the group consisting of methane and other hydrocarbon(s).

17. (Previously Presented) The process as claimed in Claim 1, wherein the reactive diluent fluid comprises molecular hydrogen.

18. (Previously Presented) The process as claimed in Claim 1, wherein the reactive diluent fluid comprises water.

19. (Original) The process as claimed in Claim 18 wherein the water is in the form of liquid water.

20. (Original) The process as claimed in Claim 18 wherein at least a portion of the water is in the form of steam.

21. (Previously Presented) The process as claimed in Claim 1 wherein the heat exchange-reformed syngas product or a syngas mixture derived therefrom is used in a downstream conversion process to produce conversion products selected from the group consisting of hydrocarbon liquid fuels, methanol, DME and oxo-alcohols.

22. (Previously Presented) The process as claimed in Claim 1 further comprising combining a second diluent fluid with a syngas stream between the point at which the reactive diluent fluid is combined with said exothermically-generated syngas product and the point at which heat is recovered from the reacted syngas product to adjust the temperature and/or change the composition of relevant syngas stream.

23. (Original) The process as claimed in Claim 22 wherein the second diluent fluid is combined with the reactive mixture in any section of the second reactor.

24. (Original) The process as claimed in Claim 22 wherein the second diluent fluid is combined with the reacted syngas product at any point between the second reactor and the heat exchange reformer or, where the heat exchange reformer is a shell and tube style reformer in which the endothermic reforming reaction occurs within the tubes and the reacted syngas product is introduced to the shell-side, in any section of the shell-side of the heat exchange reformer.

25. (Original) The process as claimed in Claim 24 comprising combining molecular hydrogen as the second diluent fluid with the reacted syngas product to enhance the heat exchange efficiency inside the heat exchange reformer.

26. **(Currently Amended)** The process as claimed in Claim 24 comprising combining water and/or steam as the second diluent **fluid** with the reacted syngas product to reduce the amount of metal dusting inside the heat exchange reformer and/or to adjust the temperature of the reacted syngas product.

27. (Previously Presented) The process as claimed in Claim 22 wherein the second diluent fluid is inert.

28. (Previously Presented) The process as claimed in Claim 22 wherein the second diluent fluid is selected from the group consisting of water vapour, steam, liquid water, molecular

Applicant : Wang, et al.
Serial No. : 10/518,038
Filed : December 13, 2005
Page : 7 of 9

Attorney's Docket No.: 21280-0013US1

hydrogen, carbon dioxide, methane, other hydrocarbons, off-gas from downstream processes, combustion furnace flue gases and gas turbine exhaust gas.

29-43. (Canceled)